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Data in the ADS – Understanding How to Use it Better

Carolyn S. Grant, Alberto Accomazzi, Donna Thompson, Edwin Henneken, Günther Eichhorn, Michael J. Kurtz, and Stephen S. Murray

*Harvard-Smithsonian Center for Astrophysics, 60 Garden Street,
Cambridge, MA 02138*

Abstract. The Smithsonian/NASA ADS Abstract Service contains a wealth of data for astronomers and librarians alike, yet the vast majority of usage consists of rudimentary searches. Hints on how to obtain more focused search results by using more of the various capabilities of the ADS are presented, including searching by affiliation. We also discuss the classification of articles by content and by referee status.

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1. Introduction

Although the Smithsonian/NASA Astrophysics Data System (ADS) is used practically daily by most working astronomers and used regularly by most working astronomy librarians, we have found that there is not significant usage beyond basic searching by the large majority of ADS users. While it is certainly the case that basic searching must satisfy a percentage of these users, it is also very likely the case that some of them would benefit from understanding how to make better use of the ADS in their searching.

We have done several things in an effort to educate people about how to improve their use of the ADS; we hand out “hints on better use of the ADS,” we give talks, and we present posters. Additionally, we introduced the myADS notification service with the intention of customizing searches to user’s specific interests. We have also made software changes such as the improved author searching implemented in the beginning of 2006 to try to anticipate better what the user really wants. While none of these things alone seems to be changing general ADS usage, we believe that gradually our user base is becoming better educated on modifying their use of the ADS.

2. Data Holdings in the ADS

Since hitting one million abstracts in January 1998, the number of abstracts in the ADS has grown steadily over time. Likewise, since the initial purchase of citations from the Institute for Scientific Information (ISI) in 1999, the citations have also continuously climbed, particularly since 2002 when many of the journals began providing us with references in electronic format.

As of September 2006, the ADS contained a total of 4.87 million abstracts divided into four databases: Astronomy (1.2 million), Physics (3.04 million),

Preprints (0.38 million), and General Science (0.38 million). Of these, 3.20 million contain abstracts (66%) and 1.61 million have references (34%). In addition, the ADS contained 20.3 million citation pairs, 3.3 million scanned pages, and 4.9 million external links as of September 2006.

3. More Effective Searching in the ADS

Analysis of our data logs shows that the large majority of users perform simple author queries to find their papers of interest. Therefore, for a typical user to gain more effective searching from the ADS, we need to teach them how to improve their current search mode. We do this by broadcasting typical search hints and by advertising the usefulness of the myADS alerting service to inform users of new articles by those authors or about those topics in which they are most interested.

The myADS Update Service is our free custom notification service promoting current awareness of the recent technical literature in astronomy and physics. Approximately every 10 days, we scan the literature added to the ADS since the last update and create custom lists of recent papers for each subscriber, formatted to allow quick reading and access. Subscribers are notified by e-mail in html format. One can have separate notifications for the different ADS databases and daily and/or weekly notification for the arXiv e-print database in collaboration with the arXiv e-print server.

In addition, we have other features to offer the more advanced user. For example, we provide the capability to turn any ADS query into an RSS feed by clicking the RSS link at the bottom of a results list. Users can then use an RSS reader such as myYahoo or Mozilla Firefox to read results from that query on a regular basis. Users may also find it helpful to use our private library feature to group together articles that they commonly use or reference. Private libraries are available at unique URLs so that they can be shared with colleagues.

We also find that a number of librarians regularly search the ADS with very complicated queries to try to isolate papers about topics or telescopes particular to their institutions. Feedback with the ADS staff may help to fine-tune these queries, and it is also good practice to disable synonyms for individual words such as acronyms, which may have alternative meanings as stand-alone words.

3.1. Searching Tips

- Use Full Name: Since January 2006, the default has been to use full author first and middle names as opposed to truncating at the author's first initial.
- First Author Only: Use a caret to get only articles where an author is the first author of the paper, “last name[, first name]”.
- Publication Month: Omit month whenever possible so that unknown months (listed as “00”) are not excluded.
- Object Searching: Include in SIMBAD object box *and* in abstract text field (which searches text and title) to maximize results.
- Journal Selection: Use the Filters Section of the Main Query Form to select or deselect specific publications, as well as to limit to refereed publications.

- **Disabling a Synonym:** To disable a synonym for a single word, prepend an equal sign “=” to the word you wish to match exactly, (e.g. =reddening, if you want to exclude abstracts using the word red).

3.2. Additional Searching Possibilities

Two other search capabilities deserve mentioning as they are not commonly used, but have the potential to be very important for those tracking papers by authors at a given institution. First, on the main query page we offer the capability of selecting bibliographic records which are within a specified “group,” where the group may be defined as papers by researchers at a given institution or papers using data from a given telescope. We primarily enlist the help of institutional librarians in maintaining these groups, which enable scientists to make institute-wide searches easily, as well as to make bibliometric compilations trivial.

In addition, we offer a basic affiliation search which we have not integrated into the main query form because affiliations found in the ADS databases are inconsistently formatted, contain a lot of noise, and most importantly only exist for about half of the entries in the database. This means that a search by affiliation generates very biased results. However, given the number of requests we have had on this subject, we have created a separate query form allowing a user to search for different affiliation spellings in the database and subsequently retrieve any records containing them. That form is available at http://adsabs.harvard.edu/list_aff.html. Note however, that because of the limitations of this type of search, we continue to recommend that people use author searches when compiling bibliometric studies for particular institutions until we are able to find the manpower or collaborators needed to improve this service.

4. Classification Issues in the ADS

As journal articles are incorporated into the ADS, there are sometimes decisions to be made as to how these articles should be classified. Articles are classified into separate databases to allow for discipline-specific searching, and articles are classified as refereed or non-refereed so that users have the ability to discern between the two.

4.1. Classification of Articles into Separate Databases

The classification of articles into separate databases in the ADS is currently done on a journal-by-journal basis for most journals. For journals which span multiple disciplines, such as *Science*, *Nature*, and *Publications of the National Academy of Sciences* (PNAS), we use keywords provided by the journal to decide where to index the articles. However, this does not correctly classify all articles, as keywords are not always correctly anticipated, and some journals are not able to provide us with accurate keywording. Furthermore, this method does not work for some journals which publish across disciplines, such as physics journals which occasionally publish special astronomy conferences.

We found that we needed a solution which allowed us to automate classification so that material currently in one database can additionally be included

in a more appropriate database. This would give us the ability to find material already indexed in one database which should be included in a different database.

As a result, we have created a classification tool which uses the Abstract Service to generate a score of how that abstract ranks against each database. Once parameters are adjusted (such as the minimum number of words, the weighting of certain words, and the weighting of citations from core journals), the classifier computes a score indicating how relevant the input article is to each of the ADS databases and assigns the article to the database with the highest score.

We expect to use this tool to check the relevance of all articles in the Physics and General Science databases. Fine-tuning is still in progress so that individual titles do not need to be monitored before we can run it over large numbers, but we expect to be able to use it to improve the division of databases by content.

4.2. Classification of Articles into Refereed vs. Non-Refereed

The classification of articles into refereed versus non-refereed status in the ADS is currently done largely by hand. Based on our knowledge of the status of a given journal, together with input gathered both from journal editors and librarians, we attempt to declare a status of either refereed or non-refereed. There are several problems with this approach, the biggest ones being: (1) it is subjective – journal editors tend to believe their journals are refereed while librarians or scientists may not agree. We should not be making the final decision; (2) it is time-consuming – doing the work by hand involves researching any questionable conferences by hand, sending emails, asking editors for clarification on refereeing status; and (3) it may blur the importance of the qualifier “refereed” – refereed journals are publishing conference proceedings either in their main journal or as a supplement. Are these refereed to the same standard?

Users and librarians would like us to be strict in our definition of what qualifies as a refereed paper, but many editors believe that any refereeing process at all qualifies a paper as being refereed. Is there more than one level of refereeing standard? If so, how could the ADS apply this? Nature, for example, is examining an alternative model of an open peer-review process for their articles.

5. Conclusion

Because so many people use the ADS on such a regular basis, it is a difficult task to convince people to spend time learning how to improve their use of the ADS. When we attend conferences, we find that most people do not spend the time to stop by our booth, telling us as they walk by that they “use us all the time.” Therefore, we find it difficult to spread word to the community that small changes may greatly improve their search results. Since the default searching works well for the majority of users, we have tried instead to concentrate our efforts on improving the default searching, improving the data, and creating services that will generate results that the users desire, with minimal effort required by the user. Based on feedback from users, we believe the majority of them are satisfied, therefore we will continue to channel our efforts in these directions.